THE EFFECTIVENESS OF COOPERATIVE LEARNING TYPE QUESTIONS STUDENTS HAVE (QSH) AND NUMBERED HEADS TOGETHER (NHT) TOWARDS THE MATHEMATICS LEARNING OUTCOMES

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ABSTRACT

Mathematical learning models with direct learning used so far can be one of the causes of poor mathematics learning outcomes. One way to overcome mathematics's poor learning outcomes is by applying learning models that involve more student activities. Several learning models involve more student activities so that learning takes place more meaningfully for students, cooperative learning. This study aims to determine which is more effective between the Questions student's Have (QSH) type of cooperative learning model and Numbered Heads Together (NHT) cooperative learning model on students' mathematics learning outcomes. This study's population were eighth-grade students consisting of 7 classes, samples taken by purposive sampling to class, obtained by class VIII-G as experimental class 1 with QSH learning, and class VIII-F as experimental class II with NHT learning. The type used in this study is experimental research with a quantitative research approach. The research method is a post-only control design. The instruments used are post-test questions in the form of multiple-choice tests. Instrument testing uses the Validity Test, different power, reliability test, and level of difficulty. Data analysis techniques consisted of the initial ability normality test, initial ability homogeneity test, and comparing the average scores of students' mathematics learning outcomes. The study results obtained the average test scores of class G students' mathematics learning outcomes as experimental class I with QSH learning at 70.61. The average test scores of class F mathematics learning outcomes as experimental class II with NHT learning amounted to 59.70. There are differences in students' mathematics learning outcomes using the QSH type cooperative learning model with the NHT type cooperative learning model. The difference in the average value of the test results of the experimental class I with QSH learning and experimental class II with NHT learning was 10.91 with the average value of students' experimental learning outcomes of the experimental class I with QSH learning was higher than the experimental class II with NHT learning. This means that the Questions Students type cooperative learning model has more effective than the Numbered Heads Together type learning model of students' mathematics learning outcomes.

Keywords: Effectiveness, Questions Students Have (QSH), Numbered Heads Together (NHT), Mathematics Learning Outcomes.

INTRODUCTION

Education is one of the essential aspects of life because, through education, a person can increase knowledge, abilities, and self skills. According to Law No. 20 of 2003 concerning the National Education System states that education is a conscious and planned effort to realize the learning and learning process so that students actively develop their potential to have religious, spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by himself, society, nation, and country. According to law Number 20 of 2003, in organizing education, it is not merely to achieve learning outcomes, but how to obtain the results of the learning process that occurs in students.

The teacher's implementation of learning activities in the class is prepared by the teacher in the learning implementation plan. In learning, teachers use various types of strategies or learning models that fit the objectives to be achieved. According to Isjoni (2013: 8) Learning model is a strategy used by teachers to improve learning motivation, learning attitudes among students, think critically, have social skills, and achieve more optimal learning outcomes.

According to Isjoni (2013: 7), To achieve maximum results in education, various learning models continue to change from time to time. In the 2013 curriculum (K-13) known as the use of scientific approaches. This approach emphasizes learning that activates students. So that in the learning process, more student activities, while the teacher only acts as a motivator and facilitator of student activities. Various sciences are taught through learning in schools included in certain subjects, one of which is mathematics. According to Heruman (2014: 2), In mathematics, every abstract concept newly understood by students needs to be immediately strengthened to settle and lasts long in students' memories. It will be inherent in their thought patterns and action patterns. For this purpose, it is necessary to learn through actions and understanding, not just to memorize or to remember facts, because students will quickly forget this.

On September 14, 2017, an interview was conducted with Mr. Rusman Nurhadi, S.Pd as a grade VIII mathematics teacher at SMP Negeri 1 gantiwarno. Obtained information that there are some problems faced in the mathematics learning process, namely: there are students who pay less attention to the lesson during the learning process because sometimes students feel bored with the activities carried out by students who only listen to the teacher's explanation and then do the exercises given by the teacher so that students lack involvement in the learning process, the use of group learning has been done, but the learning outcomes are less than optimal because sometimes students are only focused on one teaching material/material/examples of questions used for discussion, lack of students' courage in expressing ideas and opinions or still feel ashamed ask when you are not too familiar with the material being taught. This resulted in the learning outcomes of students of class VIII at State Junior High School (SMP Negeri) 1 Gantiwarno, which were less than optimal.

Then, on October 5, 2017, the second interview was held to find information on how eighth-grade students' learning outcomes at SMP Negeri 1gantiwarno. Table 1 presents the Middle Semester Exams conducted by eighth-grade students at SMP Negeri 1gantiwarno. There are still many grades of mathematics subject for VIII-Grade students who have not yet reached/met the value of 65 as the value of the minimum completeness criteria (MCC).

Table 1. Results of Midterm Even Midterm Test Results VIII of SMP Negeri 1gantiwarno Klaten

Class	Average	Total students		Presents (%)	
		Complete	No Complete	Complete	No Complete
A	55,20	9	26	25,71%	74,29%
B	49,77	6	29	17,14%	82,86%
C	55,47	3	31	8,82%	91,18%
D	55,37	6	29	17,14%	82,86%
E	57,03	10	24	29,41%	70,59%
F	57,06	8	26	23,53%	76,47%
G	55,85	3	31	8,82%	91,18%

Source: SMP Negeri 1 Gantiwarno

To solve the above problems, the researcher tries to apply more effective learning to improve student mathematics learning outcomes to reach/meet the value of 65 as a minimum completeness criteria (MCC) in SMP Negeri 1 Gantiwarno Klaten. Some learning that can be used as learning innovations is cooperative learning types of QSH and NHT. QSH type cooperative learning is learning that aims to make students more active in following the learning process. Questions Students Have is a way not to make students afraid to learn what they need and expect. Because this strategy utilizes a technique that invites participation through writing, not discussion (Silberman, Melvin L. 2006: 91). Meanwhile, NHT is cooperative learning that involves many student activities in each group. According to Lestari, Karunia Eka, and M. Ridwan Yudanegara (2015: 44), Numbered Head Together (NHT) is one type of cooperative learning that conditions students to think together in groups where each student is given a number and has the same opportunity in answer the problems raised by the teacher through random calling numbers.

Using cooperative learning type QSH and NHT, it is expected that student involvement in the learning process has more role in students' learning process so that students' learning outcomes are more

optimal. The objectives of this research are: 1) To determine whether there are differences in mathematics learning outcomes between students whose learning uses QSH type cooperative learning compared to those that use NHT type cooperative learning. 2) To determine the effectiveness of QSH type cooperative learning compared to NHT type cooperative learning towards mathematics learning outcomes of Grade VIII students of SMP Negeri 1gantiwarno Klaten.

METHODS

According to Sugiyono (2015: 3), In general, the research method is defined as a scientific way to obtain data with specific purposes and uses. The type used in this research is experimental research with quantitative research approaches. Sugiyono (2015: 107) argues that the experimental research method can be interpreted as a research method used to look for the effect of specific treatments on others under controlled conditions. This experimental design's quantitative research method is a post-test-only control design (Sugiyono, 2015: 112). The design of this study only uses post-test scores in testing hypotheses. Data collection was carried out at SMP Negeri 1gantiwarno Klaten. Retrieval data was carried out in the even semester of 2017/2018 on May 04 until May 15, 2018. This study's population were all students of class VIII, even semester of SMP Negeri 1gantiwarno Klaten consisting of 7 classes, namely classes VIII-A, VIII-B, VIII-C, VIII-D, VIII-E, VIII-F, and VIII-G with 241 students. In this study, the sample was taken with a nonprobability sampling technique with a purposive sampling type. It said purposive sampling because of the sampling technique with specific considerations (Sugiyono: 2015).

In this study, the classes used are class F and class G. The experimental class I using QSH type cooperative learning, and class F as the Experiment II class using NHT type cooperative learning. Then both classes were given a post-test to find out the value of learning outcomes. Post-test is given in the form of multiple-choice questions totaling 25 items. If the average value of the learning outcomes of the experimental class I is better than the experimental class II, it means that the learning model of the QSH type of cooperative learning is more effective than the NHT type of cooperative learning for the mathematics learning outcomes of grade VIII students of SMP Negeri 1gantiwarno Klaten.

METHODS

The research data were taken from students of class VIII-F and VIII-G of SMP Negeri 1 Gantiwarno Klaten in the even semester of the academic year 2017/2018. The results of the analysis of the research data. First, the initial ability scores of students of class VIII-F and class VIII-G. The initial ability scores were obtained from the midterm tests results in class VIII of SMP Negeri 1 Gantiwarno Klaten in the academic year 2017/2018 in mathematics. A summary of the initial mathematical ability values can be seen in table 2.

Table 2. Summary description of the initial ability scores of the Middle Semester Deuteronomy scores

Variable	Class VIII-G	Class VIII-F
Total students	33	33
The highest score	84	85
Lowest value	44	45
Average	55,85	57,62
Standard deviation	8,57	8,91
Variance	73,38	79,43

The initial ability value is then tested with a normality and homogeneity test. A normality test is used to test whether the data used is normally distributed or not. At the same time, the homogeneity test is done to determine the variance of the two experimental classes having the same variance or not. A summary of the results of normality test calculations for the two experimental classes is presented in Table 3.

Table 3. Summary of Initial Ability Normality Test Results

Class	χ_{count}	χ_{table}	Significant Level	Df (k-1)	Information
VIII-G	2,845	5,9915	5%	2	Normal
VIII-F	3,903	5,9915	5%	3	Normal

Based on the calculation of the normality test in table 3 above, it can be seen that in class VIII-G $\chi^2_{\text{count}} = 2{,}845$ and $\chi^2_{\text{table}} = 5{,}9915$ so $\chi^2_{\text{count}} < \chi^2_{\text{table}}$ then class VIII-G usually is distributed data. In class VIII-F $\chi^2_{\text{count}} = 3{,}903$ and $\chi^2_{\text{table}} = 5{,}9915$ so $\chi^2_{\text{count}} < \chi^2_{\text{table}}$, the initial ability data of class VIII-F usually is distributed data.

A summary of the results of the homogeneity test calculation can be seen in table 4.

Table 4. Summary of Initial Ability Value Data Homogeneity Test

F_{count}	F_{table}	Significant Level	Df numerator	Df denominator	Information
1,04	1,80	5%	32	32	Homogeneous

Based on the homogeneity test calculation in table 4 above, it can be seen that $F_{\text{count}} = 1{,}04$ and $F_{\text{table}} = 1{,}80$, so $F_{\text{count}} < F_{\text{table}}$, then both classes have the same or homogeneous variance.

The second analysis of the study results is the analysis of student mathematics learning achievement test scores. A summary of students' mathematics learning achievement test scores can be seen in table 5.

Table 5. Summary of the Description of the Test Score of Learning Mathematics Results

Variable	Experimental class I (QSH)	Experimental class II (NHT)
Total students	33	33
The highest score	100	100
Lowest value	30	30
Average	70,61	59,70
Standard deviation	22,63	19,44
Variance	512,12	378,03

From the above student mathematics learning achievement test results, further hypothesis testing is performed by comparing the average test scores of students' mathematics learning outcomes of the two experimental classes.

This hypothesis test was conducted to find out whether there were differences in the value of mathematics learning outcomes between students who received learning with the QSH type cooperative learning model and the value of mathematics learning outcomes of students who used the NHT type cooperative learning model in class VIII students of SMP Negeri 1gantiwarno Klaten even semester of the school year 2017/2018. Based on the results of the analysis conducted by comparing the average value of learning outcomes that the average value of mathematics learning outcomes of students of class VIII-G is different from the average value of mathematics learning outcomes of students of class VIII-F, means that there are differences in learning outcomes of mathematics between students receiving learning with the QSH type cooperative learning model and the mathematics learning outcomes of students who use the NHT type cooperative learning model in class VIII students of SMP Negeri 1gantiwarno Klaten in the academic year 2017/2018.

Hypothesis testing by comparing the average test scores of students 'mathematical learning outcomes in the two experimental classes is also done to find out whether there are differences in the value of mathematics learning outcomes between students who get learning with QSH type cooperative learning models and the value of students' mathematics learning outcomes using learning models NHT suitable types in VIII-Grade students of SMP Negeri 1 Bukawarno Klaten in the even semester of the academic year 2017/2018, was also conducted to find out whether the QSH type of cooperative learning model was more effective than NHT type cooperative learning models towards mathematics learning

outcomes of VIII-Grade students of SMP Negeri 1 Gantiwarno Klaten even semester of the academic year 2017/2018.

Based on the analysis results by comparing the average value of learning outcomes, the average value of students of class VIII-G is higher than the average value of mathematics learning outcomes of students of class VIII-F. The average value of mathematics learning outcomes of class students VIII-G is 70.61, while the average grade of students learning outcomes in class VIII-F is 59.70. The average value of learning outcomes for students of class VIII-G disagree 10.91 with the average value of students learning outcomes of class VIII-F, it means that the results of learning mathematics students who use learning with the type of cooperative learning model QSH are more effective than the cooperative learning model type of NHT on mathematics learning outcomes of students of class VIII SMP Negeri 1gantiwarno Klaten in the academic year 2017/2018.

Through cooperative learning type QSH, students can play an active role in the learning process, more meaningful for students because they can participate more and understand the material with the group. Based on researchers' observations, when using the QSH type cooperative learning model, students look earnestly to understand the material being taught. In the type QSH cooperative learning, students are required to ask questions. In making this question, students will review the material that has been taught, and then students will study each material so that students can make questions that will be written on the question paper. This was also shown by the increase in mathematics learning outcomes of students who took part in learning using the QSH type cooperative learning model compared to students who took lessons using the NHT learning model.

CONCLUSION

Based on the results of research and discussion as described, the following research conclusions can be drawn:

1. There is a difference in mathematics learning outcomes between students who get learning with QSH type cooperative learning models and student mathematics learning outcomes using NHT type cooperative learning models in class VIII students of SMP Negeri 1 Gantiwarno Klaten in the academic year 2017/2018. This is indicated by the results of the first hypothesis test where the results of the analysis are conducted by comparing the average value of learning outcomes that the average value of mathematics learning outcomes for students of class VIII-G is different from the average value of mathematics learning outcomes for students of class VIII-F.
2. Mathematics learning of students whose learning uses the QSH cooperative learning model is more effective than mathematics learning models of students whose learning uses the NHT type cooperative learning model of mathematics learning outcomes of VIII-Grade students of SMP Negeri 1gantiwarno Klaten in the academic year 2017/2018. This is indicated by the results of the second hypothesis test where the results of the analysis are conducted by comparing the average value of learning outcomes that the average value of mathematics learning outcomes for students of class VIII-G is higher than the average value of mathematics learning outcomes for students of class VIII-F. The average value of mathematics learning outcomes for class VIII-G students is 70.61, while the average value of mathematics learning outcomes for class VIII-F students is 59.70. The average value of class VIII-G students' mathematics learning outcomes is 10.91, with the average value of grade VIII-F students' mathematics learning outcomes.

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